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IS 8217 (1976): Dimensions for pipe thread runouts and undercuts [PGD 31: Bolts, Nuts and Fasteners Accessories]



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Indian Standard
**DIMENSIONS OF
 PIPE THREAD RUNOUTS AND UNDERCUTS**

1. Scope — Covers the dimensions of runouts and undercuts for external and internal parallel pipe threads conforming to IS : 2643-1975 'Dimensions for pipe threads for fastening purposes (Parts I, II and III)' and parallel internal threads conforming to IS : 554-1975 'Dimensions for pipe threads where pressure tight joints are required on the threads (*second revision*)'.

2. Runouts

2.0 Runout, wherever it occurs, shall include the washout thread and a clearance, where a clearance is required.

2.1 Runout for External Threads — The length of runout x shall be measured from the point at which the thread ceases to be fully formed. Fig. A (see Table 1) illustrates the runout. Three values of runouts for external threads are given in Table 1.

2.2 Runout for Internal Threads — The length of runout x_1 shall be measured from the point at which the thread root ceases to be fully formed. Fig. C (see Table 2) illustrates the runout. Two values of runout for internal threads are given in Table 2.

3. Undercuts

3.1 Undercuts for External Threads — Two values of undercuts for external threads are given in Table 1 and illustrated by Fig. B (see Table 1). The diameter of undercut g on external threads is given in Table 1, where d is the major diameter of thread.

3.2 Undercuts for Internal Threads — Two values of undercuts for internal threads are given in Table 2 and illustrated by Fig. D (see Table 2). The diameter of undercut is given in Table 2, where d is the major diameter of thread.

4. Guide for Application

4.1 Unless otherwise specified, only the normal values of x , x_1 , f and f_1 given in Tables 1 and 2 shall be used.

4.2 Values for long runout shall be used for hard work pieces.

4.3 Values for short runout shall be used only in cases justifying their absolute necessity.

TABLE 1 THREAD RUNOUTS AND THREAD UNDERCUTS FOR EXTERNAL THREADS

(Clauses 2.1 and 3.1)

All dimensions in millimetres.

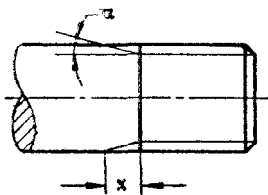
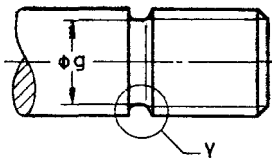


FIG. A RUNOUTS



DETAIL Y

FIG. B UNDERCUTS

Nominal Size	Pitch <i>p</i>	Thread Runout			Thread Undercut		<i>r</i> ≈	<i>g</i> h13
		Width <i>x</i>			Width <i>f</i>			
		Long <i>Max</i>	Normal <i>Max</i>	Short <i>Max</i>	Normal	Short		
		For runout angle α			For runout angle α			
		15°	22½°	30°	22½°	30°		
1/16	0.907	2	1.6	1	2	1.6	0.8	8.5
1/8	1.337	3.5	2	1.6	3	2	1	11.4
3/16	1.337	3.5	2	1.6	3	2	1	14.9
1/4	1.814	5	3	2	4	2.5	1.2	18.6
5/16	1.814	5	3	2	4	2.5	1.2	20.5
3/8	1.814	5	3	2	4	2.5	1.2	24.1
1/2	2.309	6	4	2.5	5	3	1.6	27.8
5/8	2.309	6	4	2.5	5	3	1.6	d-4
3/4	2.309	6	4	2.5	5	3	1.6	d-4
7/8	2.309	6	4	2.5	5	3	1.6	d-4
1	2.309	6	4	2.5	5	3	1.6	d-4
1 1/8	2.309	6	4	2.5	5	3	1.6	d-4
1 1/4	2.309	6	4	2.5	5	3	1.6	d-4
1 1/2	2.309	6	4	2.5	5	3	1.6	d-4
1 3/4	2.309	6	4	2.5	5	3	1.6	d-4
2	2.309	6	4	2.5	5	3	1.6	d-4
2 1/4	2.309	6	4	2.5	5	3	1.6	d-4
2 1/2	2.309	6	4	2.5	5	3	1.6	d-4
2 3/4	2.309	6	4	2.5	5	3	1.6	d-4
3	2.309	6	4	2.5	5	3	1.6	d-4
3 1/2	2.309	6	4	2.5	5	3	1.6	d-4
4	2.309	6	4	2.5	5	3	1.6	d-4
4 1/2	2.309	6	4	2.5	5	3	1.6	d-4
5	2.309	6	4	2.5	5	3	1.6	d-4
5 1/2	2.309	6	4	2.5	5	3	1.6	d-4
6	2.309	6	4	2.5	5	3	1.6	d-4

Note 1 — Thread end shall be chamfered off at 45° down to the minor diameter of the thread.

Note 2 — In the case of external threads provided with runout it is recommended that the mating internal thread be countersunk at 60°.

Note 3 — The tabulated values for *g* apply to fine pitch threads.

TABLE 2 THREAD RUNOUTS AND THREAD UNDERCUTS FOR INTERNAL THREADS
(Clauses 2.2 and 3.2)

All dimensions in millimetres.

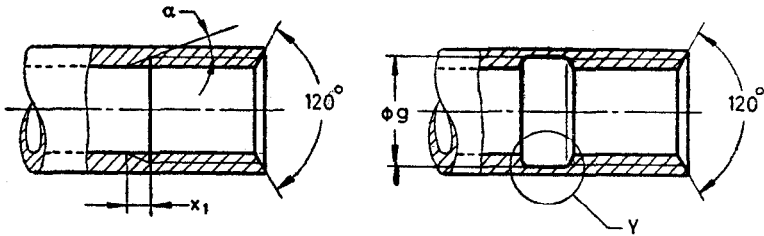


FIG. C RUNOUTS

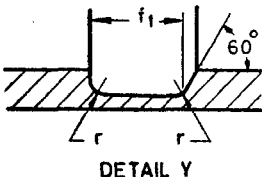


FIG. D UNDERCUTS

Nominal Size	Pitch <i>p</i>	Thread Runout		Thread Undercut		<i>r</i> ≈	<i>g</i> H13
		Width <i>x</i> ₁		Width <i>f</i> ₁			
		Normal	Short	Normal	Short		
		For runout angle α		For runout angle α			
		7°	20°	7°	20°		
1/8	0.907	4.1	1.6	5	2.5	0.8	9.8
1/4	1.337	6.2	2.4	7	3.5	1	13.2
3/8	1.337	6.2	2.4	7	3.5	1	16.7
1/2	1.814	8.5	3.2	10.0	5	1.2	21.0
3/4	1.814	8.5	3.2	10.0	5	1.2	23.0
1	1.814	8.5	3.2	10.0	5	1.2	26.5
1 1/8	1.814	8.5	3.2	10.0	5	1.2	30.3
1 1/4	2.309	10.5	4	10.0	5	1.6	<i>d</i> +0.5
1 1/2	2.309	10.5	4	10.0	5	1.6	<i>d</i> +0.5
1 3/4	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
2	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
2 1/4	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
2 1/2	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
2 3/4	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
3	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
3 1/4	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
4	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
4 1/2	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
5	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
5 1/2	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5
6	2.309	10.5	4	12.0	6	1.6	<i>d</i> +0.5

Note 1 — Thread ends shall be countersunk at 120° to include the major diameter of the thread.

Note 2 — The tabulated values for *g* apply to fine pitch threads.

EXPLANATORY NOTE

When a threading operation is not performed throughout the length of the component, then due to the necessary throat angle or taper lead on the threading tool, the last few threads cannot be perfectly formed. The length of these washout threads make the thread runout on the component.

An undercut of reasonable width allows threads to be cut on a component up to the end without the end face of the screwing tool fouling the component. Design requirements are usually for a reasonable degree of control on the diameter at the root or crest of the undercut to avoid weakening the section at this point, and for sufficient radius at the end of the undercut to avoid stress concentration. The production requirement is for an adequate width of undercut to allow the use of dies and taps with a reasonable throat angle or taper lead.

In preparing this standard, assistance has been derived from DIN 76 (Sheet 2), Nov 1953 'Gewinderillen; Gewindeenden für Whitworth Gewinde und Whitworth-Rohrgewinde (Screw thread, runouts, undercut ends, whitworth thread, whitworth pipe threads)' issued by the Deutsches Institut für Normung.